AFWERX

INNOVATION HANDBOOK

VERSION 1.0

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AFWERX

INTRODUCTION

WHAT IS THE SQUADRON INNOVATION FUND (SIF)?

In an era of great power competition, our squadrons, more than ever, are the heartbeat of the Air Force. To foster innovation at the level of command that makes the greatest impact, Secretary Heather Wilson and General David L. Goldfein initiated a second year of Squadron Innovation Funds ("SIF") for fiscal year 2019 so commanders can tackle their most pressing readiness and national-security challenges.

In keeping with previous guidance, we must continue to **THINK BIG**, **start small**, and ***Scale Fast***!

THINK BIG. Cultivating innovation at the edge not only resolves local challenges but also leads to revolutionary concepts and capabilities that will shape our future. This kind of innovation happens when any Airman, at any level, can drive capability development, organizational problem-solving, and policy or process changes. We create this environment when leaders are willing to squint with their ears, units and higher headquarters adopt a learning culture, and everyone embraces experimenting and failing productively until we succeed.

start small. You have a problem that you face in your unit. We want to see you test out these ideas, and your Squadron Commanders have the funds to make it happen. We want you to come up with a minimum viable product. We want you to test and validate solutions at your unit. We want this to happen in weeks and months to increase both readiness and national security in our mission.

Scale Fast! Over this past year, you and your squadrons have done a superb job learning, sharing, and connecting as you executed SIF. We recognize cross-functional teams—across squadrons, wings, higher headquarters, and beyond—were a major contributor to innovation successes. To facilitate this kind of teaming, we will resource AFWERX to create several programs that directly support squadrons, wings, and MAJCOMs with the execution of SIF and enable us to scale the best ideas across the Air Force.

Our intent is to build on the innovation ecosystem started last year that catalyzes Airmen to bring their ideas forward so you can act on the best ones. I ask that you aggressively collaborate with each other and higher headquarters along the way. We need your ideas, lessons, and feedback via the AFWERX ideation platform. Please populate the virtual platform (https://usaf.ideascalegov.com) as you move forward. Specifically, check out the FY19 SIF campaign.

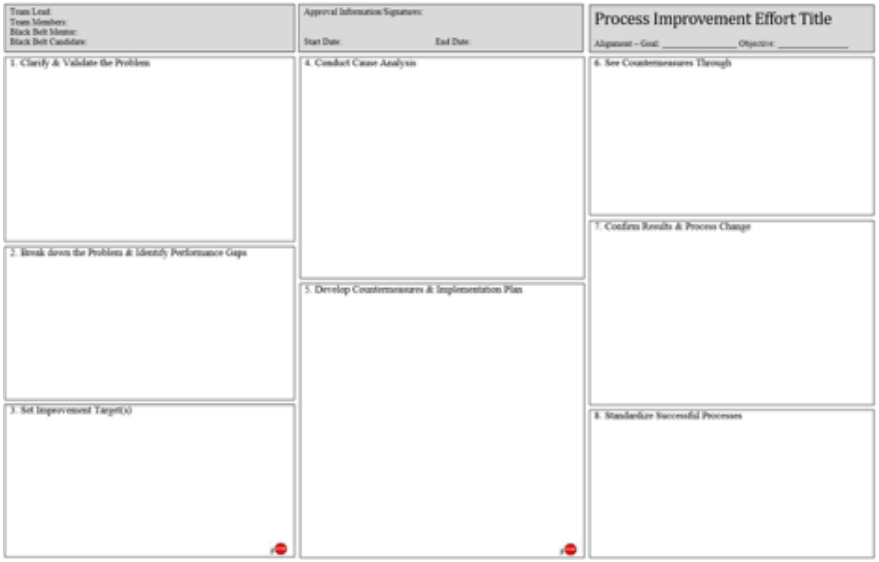
Continuous Process Improvement (or CPI) is also part of our robust innovation ecosystem the Air Force is building. It is the AF's long-term goal to have Innovation and Improvement skills embedded in the way all Airmen think and act. Our newest Airmen will know the basics and be able to participate in improvement efforts productively. As Airmen progress throughout their careers, they will develop increasing depth

and breadth of skills going beyond participation to facilitating problem-solving efforts of increasing complexity throughout end-to-end business and operations mission areas in ways that propel the Air Force into a long-term, upward spiral of accomplishment and performance.

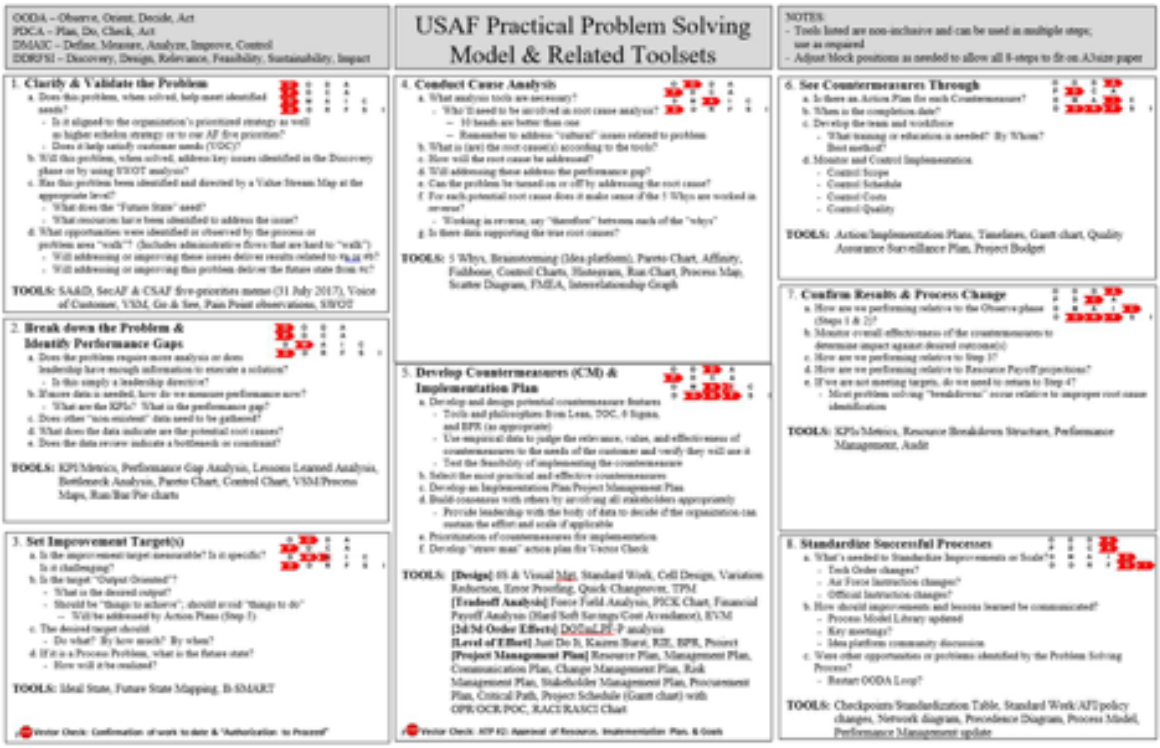
To attain this end-state, the AF embarked on an effort to jumpstart capabilities by standing up an “internal consultancy” work force consisting of three different skill levels of Improvement and Innovation mastery: Green Belt (GB), Black Belt (BB), and Master Black Belt (MBB). These certifications are attained by completing the coursework and mastering a body of knowledge associated with each level of certification, and completing a prescribed set of projects to show the Airman not only knows the material, but also has mastered application of the knowledge.

The cornerstone of the Air Force’s CPI mindset is an eight-step problem solving model. Use of the standard model provides context for issues and recommendations for leadership decision making and execution that transcends the transient nature of our workforce. When applied properly and consistently, CPI methodologies and tools help ensure problems that are solved, remain solved. The Air Force advocates using this standardized eight-step framework as the umbrella for Airmen (and certified practitioners) to facilitate improvement efforts using a host of tools that help identify root cause issues to be addressed. Airmen use this approach to document problem, context and logic of their solution. Below are two examples of our standard eight-step approach for improving processes.

This first eight step is what we call the worksheet. It's easy to carry with you and fill out as you go about understanding and capturing what you wish to innovate or improve upon.



This second eight-step is what we call the rubric. It provides the logic to be applied in each of the eight steps and lists the types of tools ideal for use in each step.



As you can see Innovation and Improvement are simply complimentary approaches in improving the work we do and in improving our Air Force. To get easy-to-read versions of the two documents above or for more help or information on CPI please contact our CPI professionals in our Air Force CPI office at usaf.pentagon.saf-mg.mbx.mgm-workflow@mail.mil.

For more information, you can reach AFWERX at SIF@afwerx.af.mil or reach out to the SIF Connect Line at 202-599-0413, which is intended to be your live help to work through any SIF problems or questions you might have!

OVERVIEW OF FINANCIAL MANAGEMENT

As a Total Force initiative, the Squadron Innovation program will encompass various funding streams. You can secure Operation & Maintenance (O&M); Procurement; and Research, Development, Training & Education (RDT&E) funding. Due to the complexity of certain ideas, external coordination with agencies such as Communication, Civil Engineering, Personnel, Legal, Finance, Contracting, or others may be required. Therefore communication early and often with these agencies and your unit Resource Advisors will be critical to ensure the program's success and timely enactment.

For example, establishing a training lab may require coordination with multiple organizations including the Local Communications Squadron and the Air Force Installation Management and Support Center (AFIMSC).

SIF has been established for each component (Active Duty, Air National Guard, and Air Force Reserve). Wing Commanders will be provided the discretionary O&M resources to invest in the most innovative ideas their Airmen bring forward to increase both readiness and lethality. SIF will be allocated with 80% going directly to the Squadron Commanders entrusted with mission success and 20% to the Wing to accelerate the best ideas and provide a competitive environment to excel. Diverting Innovation funds to other priorities outside of the APAN direction is prohibited.

All expenses must be coded with ESP “CA” for tracking purposes.

ACTIVE DUTY O&M (3400)(FC30)

Funding will be allocated across the portfolio (based on UMD population of the unit) ranging from $100K - $750K. Funds will be disbursed from SAF/FMBO to the MAJCOMs early Dec 2018. MAJCOMs will be responsible for distributing targets (bogeys) to their applicable Wings and Squadrons. Funding will be maintained at the MAJCOM level and reimburse the unit based on incurred expenses or as needed.

Collaboration and cross feeding of ideas is encouraged as shared resources can be used to solve common problems and/or produce stronger outcomes. Instances where two or more agencies pool their financial resources, funding will be distributed to the executing agency/squadron and the associated squadron bogeys will be decremented accordingly.

AIR NATIONAL GUARD O&M (3844)(FC58)

Air National Guard (National Guard Bureau) leadership has committed $9.2M to fostering the ideas of Airmen at more than 90 installations across the 54 states and territories. In order to provide a level playing field at the onset, most wings will start with a bogey of $100K with the exception of two larger populations who will receive $200K.

The NGB Innovation team will act as sounding board, catalyst and coordinator for initiatives, and will also log unfunded requirements for those wings whose ideas exceed bogeys. At established times in the budget cycle, funding will be withdrawn from units whose efforts don't result in executable plans, and all recovered funds will be repurposed to support prioritized leadership-approved innovation unfunded requirements.

AIR FORCE RESERVE O&M (3740)(FC54)

Air Force Reserve leadership has committed $4.3M to fostering the ideas of Airmen at more than 45 wings and units. In order to provide a level playing field at the onset, most wings will start with a bogey of $82k, with the exception of four larger populations which will receive $162k.

HQ AFRC/FM will work with the wings to identify unfunded requirements for those wings whose ideas exceed bogeys and present to leadership for possible funding realignments. At established times in the execution cycle, funding will be withdrawn from units whose efforts don't result in executable plans. All

recovered funds will be repurposed to support prioritized, leadership-approved, but unfunded, innovation and readiness requirements.

All expenses will be coded with ESP CA to ensure proper tracking. Wings are aware of the importance of providing answers regarding selected initiatives, and the results.

DEFENSE HEALTH PROGRAM (DHP)(FC2X)

Requirements that may fall under the purview of Innovation should be communicated through the local Medical Group Resource Management Office to the OAC Manager at the Air Force Medical Operations Agency for prioritization and consideration. Requirements will compete with other DHP unfunded requirements.

PROCUREMENT & RDT

Funding for projects requiring Procurement greater than or equal to $250,000 and RDT&E funding must be line item appropriated. If an item has not been identified within the Fiscal Year justification documentation (https://www.saffm.hq.af.mil/FM-Resources/Budget/), a New Start authority must be requested.

There are two methods for submitting an idea:

- The utilization of the US Air Force Ideation Platform is highly encouraged. As a community for innovators across the Air Force they stand ready to solve problems at the lowest level, through prototype ideas and execution. Ideas can be submitted through: https://usaf.ideascalegov.com/.

- Submit Unfunded Requirements (UFRs) through the MAJCOM. Approved innovation initiative UFRs should be forwarded to usaf.pentagon.saf-fm.mbx.saf-fmbi-integration-workflow@mail.mil.

SAF/FMBI Integration will validate the requirement and identify how funding will be processed – by either a Below Threshold Reprogramming (BTR) or an Above Threshold Reprogramming (ATR). BTRs are processed internal to the AF and can be submitted throughout the year as needed. ATRs require Congressional approval and need to be submitted two months prior to the Feb 2019 and June 2019 submissions to OSD(C). Note that the timeline is subject to change.

Once approved for funding, the project will be added to the UFR list to compete for available funds. Funding is not guaranteed and it may take several weeks to identify a source. The BTR process is 3 – 5 days and the ATR process is a minimum of 3 months.

OVERVIEW OF THE INNOVATION HANDBOOK

The Innovation Handbook is intended to provide a framework for Airmen to develop and evaluate innovative ideas, describe how to move those ideas into execution, to learn how to tap into a broader network of innovators, and, ultimately, to prepare the innovative ideas to be taken to scale.

The Handbook is not intended to be the final word on how to scale innovative ideas using the SIF program, but is intended to help provide quick reference to some of the techniques and practices that

are associated with successful solution development, and to point you to resources that can help you learn more.

The Handbook is divided into two parts. The first part of the Handbook is on *Getting (new) Stuff Done*. The Air Force is investing significant resources to help you identify and lead innovation efforts; the Handbook makes it clear how you can access them. The second part of the Handbook is on a *disciplined approach to innovation*. As you'll see, innovation is not about luck or a moment of inspiration; innovation is about dedicated focus on solving the most important problems in a systematic way.

PART ONE — GETTING (NEW) STUFF DONE

UNDERSTANDING THE ECOSYSTEM

Before diving into how we might approach getting new stuff done using the SIF program, let's reflect on the broader investment that the Air Force is making around innovation.

SIF is part of a large ecosystem for innovation. We believe a systematic approach to innovation requires resources and discipline. Without resources, we can't leverage the best ideas or transform them into production-ready solutions for the warfighter. Without discipline, spending money on innovation is just a waste of time and energy.

INNOVATION = RESOURCES + DISCIPLINE

ON TAKING RISKS (IT'S OK TO FAIL. REALLY!)

> *"I have not failed 10,000 times—I've successfully found 10,000 ways that will not work." ~Thomas Edison*

Taking risks is essential to innovation. Most projects do not work out the way they are intended; especially when addressing more difficult challenges. Taking risks is not the same as being careless. Taking risks is valuable only when it is combined with an effort to learn from the experience.

Learning from failure is critical to the innovation process; and as long as we are gaining from our efforts and sharing the results we can improve together.

And, to that end, you shouldn't face these challenges alone or take risks without a support structure. Part of the goal of the SIF program is to help Airmen connect with resources that can make it easier to try new things.

LEVERAGING AFWERX AS A RESOURCE

So where can you go to find help? Although there are many people who can help, **it is AFWERX's job to be there for you** as you're trying to bring new innovative ideas to the Air Force, whether or not it's SIF-related.

If you ever run into any blockers during the innovation process, call the SIF Help Line at 202-599-0413 or email us at sif@afwerx.af.mil.

Having trouble with OGC on a new idea you want to try? Call us.

Looking for potential early adopters for your proposed solution? Drop us a line.

AFWERX SBIR PROGRAM

Working with the AFWERX and AFRL teams we have updated the traditional SBIR process to allow the AF to source existing technologies from commercially focused technology firms. Unlike the traditional SBIR program, which suggests technical problems for companies to propose new R&D activity against, we incentivize firms to propose problems for which they can solve with their existing technology.

We hope to continue to use the flexibility of the SBIR process to work with innovative small businesses to help solve the AF's challenges. But to do so, we need your help.

Here's what we need from you:

1. **A succinct problem definition**. We do not want a requirements document, we want a broad outline of the problem you need solved. You can get in the details when you engage with the company on contract.
2. **An open mind**. The SBIR program is limited to small businesses, so you will need to be open to the idea of working with a commercial small business (less than 500 employees and US Based) to address the issues you have described.
3. **Top cover**. To proceed with use of the SBIR program, we will need to make sure you have support from your leadership to spend time pursuing this idea.
4. **Mission alignment**. To advance under SIBR, we will need a clear understanding of where the problem fits within the big AF picture.

Here's how you can do it:

1. Submit your idea on Ideascale at usaf.ideascalegov.com in the SBIR campaign here: https://usaf.ideascalegov.com/a/campaign-home/36.
2. Answer the refine questions to ensure your idea has enough detailed information and verify you have the time and leadership support.
3. Share the SBIR info with companies you want to apply to the SBIR program.

After that, AFWERX will push out these need statements during the pre-release time for the SBIR Awards based on the timelines published at https://www.acq.osd.mil/osbp/sbir/sb/schedule.shtml.

Want to get a deeper understanding of what funding options exist for your idea? Let us know!

SPARK CELLS

To help connect Airmen, AFWERX also operates a program called Spark, which has a decentralized network of “Spark Cells” on Air Force bases around the world. Each Spark Cell operates semi-autonomously in pursuit of locally generated ideas and projects. Through Ideascale, any Airman intrapreneur can leverage the people and resources across the ecosystem and organically integrate a diverse group of stakeholders in pursuit of any one project. As local projects prove successful, the AFWERX network enables rapid communication and scaling across the enterprise. There are also MAJCOM level representatives that are working with AFWERX to help the best ideas scale, please reach out to our team to get you connected to them. If you need any other support, reach out to support@afwerx.af.mil.

LEVERAGING IDEASCALE

If you are looking for inspiration or have an idea that you’re looking to try out, visit the Ideascale FY19 SIF campaign site.

Once you have decided to work on an innovation project, we want you to submit those details here, so we can help you make the project happen, connect you to others who might be working on similar initiatives, and to help track progress. We have a group of folks working with this data on the backend as well who will help get you

support from your MAJCOM's and across the AF at the Program Offices.

RESOURCES OUTSIDE OF AFWERX

Once you are ready to start scaling, you will need to identify funding that works at scale. There are many avenues to additional funding to refine your concept, test it at multiple locations, and eventually adopt it within the AF as a whole. Here are some of the avenues available:

- MD5 Prototyping Resources
- Defense Innovation Unit
- Rapid Capabilities Office(s)
- Federally Funded Research Corporations
- Air Force Research Lab

PART TWO—THE FOUR PHASES OF INNOVATION

Now that we've identified some of the resources that are part of the Air Force Innovation ecosystem, we turn to the *discipline* of innovation. As Peter Newell and Brian Miller observed: "systematic innovation means connecting invention to adoption via a disciplined framework."

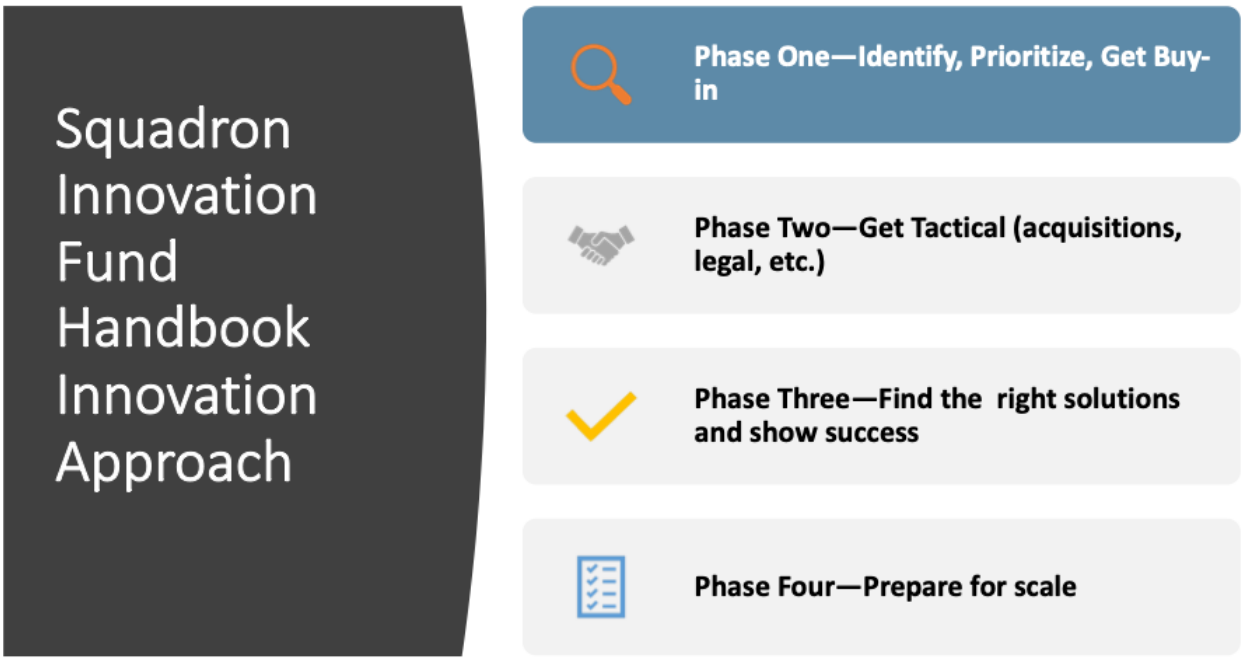
In this part, we lay out a four-phased approach to disciplined innovation:

- Phase One -- Identify, prioritize, get buy-in
- Phase Two -- Get tactical
- Phase Three -- Find the right solutions and show success
- Phase Four -- Prepare for scale

PHASE ONE—IDENTIFY, PRIORITIZE, GET BUY-IN

OVERVIEW

All successful innovative efforts start with a problem and an idea on how to solve that problem. As we will see, though, innovation and creative problem solving is a discipline that uses specific techniques to identify problems, prioritize them, evaluate the most likely routes to solve those problems, and build the support necessary to start testing the solutions. This chapter lays out some of the key techniques that innovative organizations use to develop their solutions.



WHAT IS INNOVATION?

Peter Drucker, in his 1985 work “Innovation and Entrepreneurship,” argued that innovation is a discipline:

> *Successful entrepreneurs do not wait until “the Muse kisses them" and gives them a "bright idea"; they go to work. Altogether, they do not look for the "biggie," the innovation that will "revolutionize the industry," create a "billion-dollar business," or "make one rich overnight." Those entrepreneurs who start out with the idea that they'll make it big—and in a hurry—can be guaranteed failure. They are almost bound to do the wrong things. An innovation that looks very big may turn out to be nothing but technical virtuosity; and innovations with modest intellectual pretensions, a McDonald's, for instance, may turn into gigantic, highly profitable businesses.The same applies to non business, public-service innovations.*
>
> *Successful entrepreneurs, whatever their individual motivation—be it money, power, curiosity, or the desire for fame and recognition—try to create value and to make a contribution. Still, successful entrepreneurs aim high. They are not content simply to improve on what already exists, or to modify it.They try to create new and different values and new and different satisfactions, to convert a "material" into a "resource," or to combine existing resources in a new and more productive configuration.”*

Innovation and Improvement, then, isn’t about advanced technologies or revolutionary new approaches. It’s about applying technology,

methods, or processes to solve problems facing airmen in the accomplishment of their mission. It's about finding ways to make a contribution and **aiming high**.

SIF INNOVATION HIGHLIGHTS

One SIF project funded out of McGuire AFB was a smart toolbox that enabled maintenance crews to quickly do inventory and track where all their tools were on a plane. The squadron teams performed market research and identified a potential solution. The presentation was made to the innovation liaison, a captain, and the $60K pilot request was approved on the spot!

An intelligence officer stationed in Texas wanted to provide an app, Headspace, to his entire wing. Headspace is a wellness platform that promotes mental health support through meditation and mindfulness. This active duty captain used SIF to draw a contract for 100 accounts.

To learn about some examples of innovative practices within the Air Force, consider some recent vignettes from the 480th ISR Wing, captured and published on the AFWERX website.

IDENTIFY THE RIGHT PROBLEM

If innovation and improvement is about solving problems facing airmen in the accomplishment of their mission, the first effort should be to clearly understand and define the processes of problem

definition and prioritization. This is also the first step in our eight-step approach for CPI.

Problem identification should begin by focusing on which solutions will deliver the most significant, positive impact to users. Focusing on the user will allow you to develop solutions that are impactful, adoptable, and sustainable.

When creating a good problem definition, follow these four steps:

1. **Establish the Need for a Solution.** The first step is to identify the basic need and desired outcomes. Consider how the end user would benefit from a particular solution.

2. **Justify the Need.** Ensure it is consistent with organizational mission and strategy. Indicate clear, measurable benefits to the organization when the problem is solved.

3. **Contextualize the Problem.** Even if a solution is novel, the problem probably is not. Understanding what solutions have been attempted before and how and why those solutions have not solved the problem can help you avoid repeating mistakes. You should also see whether there are others trying to solve the same or similar problems. Using the search feature in Ideascale will show others that have proposed similar ideas. They might serve as a resource for you in tackling your problem.

4. **Write the Problem-Definition Statement.** Finally, you should write out a problem statement that takes the following form: “We are looking for X in order to achieve Z as measured by W.” This form

aligns the problem with the organizational benefit, and can serve as a starting point for your future work.

PRIORITIZE AND SELECT YOUR PROBLEM

"What is important is seldom urgent and what is urgent is seldom important."~Dwight D. Eisenhower

Because there are infinite number of problems in the world, choosing which to focus on requires prioritization. President Eisenhower is credited with one of the more enduring prioritization frameworks, called the "Eisenhower Decision Principle," which organizes problems based on their urgency and importance.

	Urgent	**Not Urgent**
Important	1 DO	2 PLAN
Not Important	3 DELEGATE	4 ELIMINATE

By choosing problems that are both urgent and important, you can avoid wasting time, energy, and limited resources on less valuable efforts.

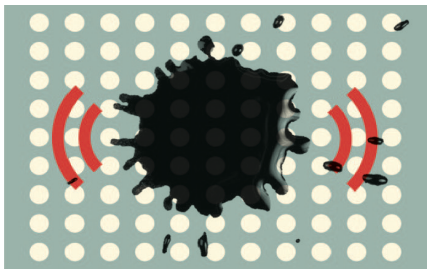
Another useful framework, advanced by Don Reinertsen, is to focus on measuring the "cost of delay" for solving the problem and then focusing on what solution will solve the problem the fastest.

Regardless of how you choose to prioritize problems or their potential solutions, focus on making sure that you are *intentional* about your solution. If you have found a better way to solve your problem, *pursue the better way* even if you have spent a lot of time developing the solution. Similarly, if there is a more important problem to be solved, *pursue the more important problem*. Do not fall prey to the "sunk-cost fallacy;" make sure that you are working to deliver the most significant, positive impact to users. Remember, innovation and improvement is about finding ways to contribute and **aiming high**.

RESEARCH & COLLABORATION

Successful innovation requires partnership to scale, but there is no reason to wait to get started! You should seek out opportunities to work with individuals and teams who are thinking about the same challenges. By leveraging existing research and finding potential collaborators, you can gain ground much faster than if you go it alone. The very design of the SIF program means that there are likely dozens—or even hundreds—of people who want to tackle the same problems you're considering. The Air Force has a central place to share ideas and work on these projects at usaf.ideascalegov.com. There are over 1,100 ideas on this platform! Please go here to search and see what others are working on. You can send them a message or find them in the global directory.

HOW WELL-DEFINED PROBLEMS LEAD TO BREAKTHROUGH SOLUTIONS



THE SUBARCTIC OIL PROBLEM

More than 20 years after the 1989 Exxon Valdez oil spill, cleanup teams operating in subarctic waters still struggled because oil becomes so viscous at low temperatures that it was difficult to pump from barges to onshore collection stations.

HOW THE PROBLEM WAS DEFINED

In its search for a solution, the Oil Spill Recovery Institute framed the problem as one of "materials viscosity" rather than "oil cleanup" and used language that was not specific to the petroleum industry. The goal was to attract novel suggestions from many fields.

THE WINNER

A chemist in the cement industry was awarded $20,000 for proposing a modification of commercially available construction equipment that would vibrate the frozen oil, keeping it fluid.

THE ALS RESEARCH PROBLEM

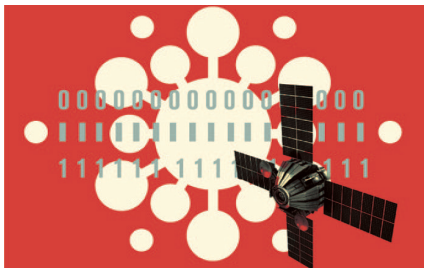
By the late 2000s, researchers trying to develop a cure or treatment for amyotrophic lateral sclerosis (ALS, or Lou Gehrig's Disease) had not made much progress. One major obstacle was the inability to detect and track the progression of the disease accurately and quickly. Because researchers could not know precisely what stage ALS sufferers had reached, they greatly increased the pool of participants in clinical trials and lengthened their studies, which drove up costs so much that few treatments were developed and evaluated.

HOW THE PROBLEM WAS DEFINED

Instead of framing its initiative as a search for a cure, Prize4Life, a nonprofit organization, focused on making ALS research feasible and effective. The solution it sought was a biomarker that would enable faster and more accurate detection and measurement of the progression of the disease.

THE WINNER

In 2011, a researcher from Beth Israel Hospital in Boston was paid $1 million for a noninvasive, painless, and low-cost approach, which detects ALS and assesses its progression by measuring changes in an electrical current traveling through muscle. This biomarker lowers the cost of ALS research by providing accurate and timely data that allow researchers to conduct shorter studies with fewer patients.



THE SOLAR FLARE PROBLEM

In 2009 NASA decided it needed a better way to forecast solar flares in order to protect astronauts and satellites in space and power grids on Earth. The model it had been using for the past 30 years predicted whether radiation from a solar flare would reach Earth with only a four-hour lead time and no more than 50% accuracy.

HOW THE PROBLEM WAS DEFINED

NASA did not ask potential solvers simply to find a better way to predict solar flares; instead, it pitched the problem as a data challenge, calling on experts with analytic backgrounds to use one of the agency's greatest assets - 30 years of space weather data - to develop a forecasting model. This data-driven approach not only invited solvers from various fields but also enabled NASA to provide instant feedback, using its archived data, on the accuracy of proposed models.

THE WINNER

A semi-retired radio-frequency engineer living in rural New Hampshire used data analysis and original predictive algorithms to develop a forecasting model that provided an eight-hour lead time and 85% accuracy. He was awarded $30,000 for this solution.

SCOPING YOUR PROBLEM IN MORE DETAIL

WHY SCOPE IS CRITICAL TO DEFINE

Once you have identified, defined, and prioritized your problem, you need to "scope" your problem and solution to force decisions about what to include, but also what to *exclude* in developing the solution. One of the biggest long-term risks to any effort is "scope creep": the addition of features, attributes, or requirements that complicate the original goal of the effort. Investing time upfront to establish the appropriate boundaries can help mitigate unplanned scope creep. Think about how you can develop a flexible-enough scope to cover unexpected developments and insights, while still avoiding scope creep and how you can avoid defining every possible feature and functionality before you even begin?

To address this tension and to help clearly define and manage scope, you should formulate a "product vision." Understanding the entire scope of the problem or in the case of a process to be improved, encompass steps one through four of our eight-step CPI approach.

ESTABLISHING A PRODUCT VISION

A product vision serves as a "North Star" to ensure alignment without overly prescribing the path and describe the motivation behind the effort. A good product vision establishes the fundamental *difference* that results from the solution. The product vision should answer what is (and is not) important in the delivery of the solution.

When shaping a product vision, there is no *single* way to do it: but as a rule, stay ruthlessly focused on solving the problem from a *user's* perspective to help focus on what is really important and what is just "nice to have."

When developing a product vision, two frameworks worth considering are Amazon's "Press Release" approach and Geoffrey Moore's "Elevator Pitch" template. Both approaches are iterative, in that they need to be refined until they describe a problem that is worth solving, and the solution will actually address the problem in a way that users will value.

AN EXAMPLE "ELEVATOR PITCH" FOR BETTER INVENTORY MANAGEMENT

Our Comm Flight spends 100 hours a month printing inventory sheets, tracking down, and reading tiny serial numbers on IT assets to accomplish a simple inventory. The solution is RFID tagging all the laptops and installing scanners at key places so that they can complete their inventory in 8-12 hours. Unlike the alternative barcoding system, our solution allows for inventory to be completed more quickly because the RFID technology can scan every IT asset in a room or area at once!

DEVELOPING INITIAL HYPOTHESES, MESSAGE, AND VALUE PROPOSITION

WHAT IS AN MVP?

A minimum viable product (MVP) is a new product released with minimally sufficient features to satisfy the needs of early adopters. The goal is to identify the minimum features required by your customers. Releasing an MVP version provides you and your team the opportunity to quickly gather feedback and learn from users to refine the next iteration. You and your team will continually design, test, and develop features based on feedback and learnings from your product users.

An MVP has three key characteristics:

- It has enough value that people are willing to use it or buy it initially
- It demonstrates enough future benefit to retain early adopters
- It provides a feedback loop to guide future development

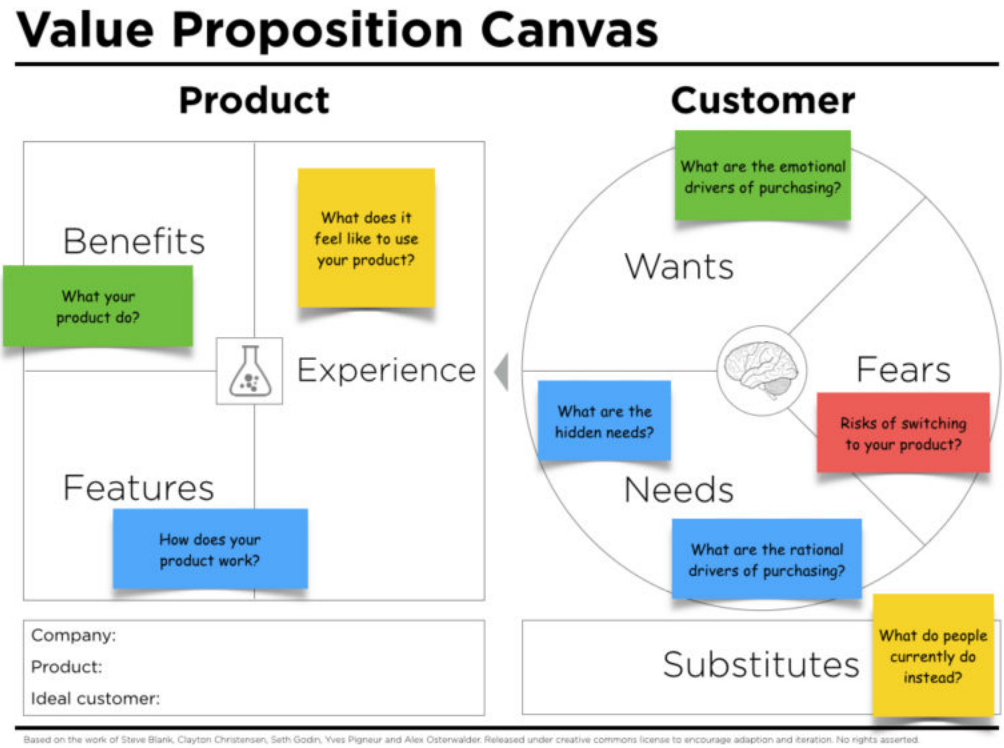
An MVP creates an opportunity to test a product with everyday users (e.g., conduct usability testing) to evaluate its performance and solicit direct feedback. Conduct MVP testing on a small percentage of your users. Compare these test results to your base users' feedback (A/B testing). MVPs are most effective when the product owner and team members are open to incorporating the feedback users provide. When leveraged appropriately, MVPs can:

- Significantly reduce the product's cost and the time needed for refinement
- Validate your product, features, service, and/or idea
- Decrease the team's learning curve

Again, innovation and improvement align and complement each other as the Air Force evaluates proposed countermeasures to continually improve processes in step five of our eight-step CPI approach.

WRITING A STRONG VALUE PROPOSITION

One way to ensure that you've written a strong value proposition is to use a "value proposition canvas." Below is a sample value-proposition canvas (there are others out there if you look for them) you can use to help make sure that you've done enough homework to have confidence in your solution's approach:



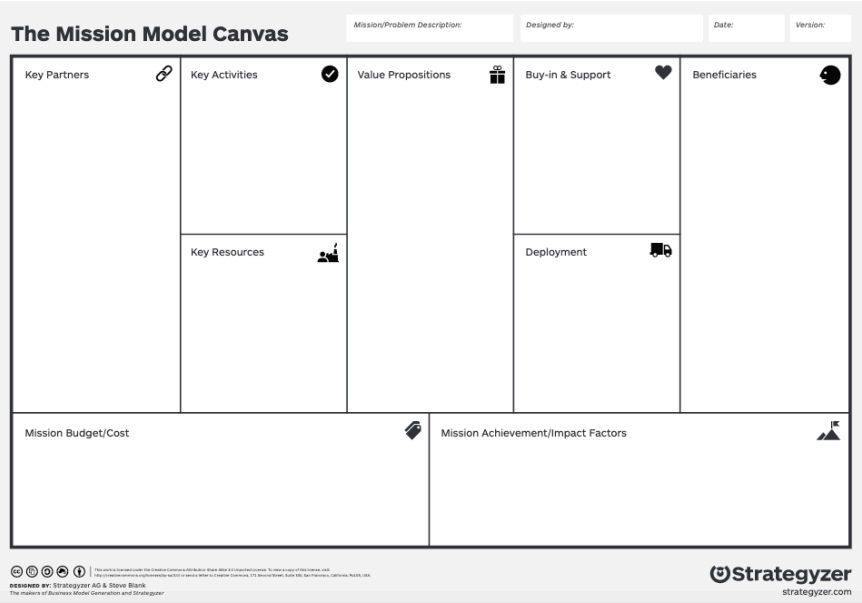
By Peter J Thomson, at Value Proposition Canvas Template.

As you can see from the canvas above, answering questions about both the nature of the solution and the expectations of the user will help make sure that you can quickly evaluate whether your proposed solution will address your desired users' needs.

ALIGNING TO MISSION

Once you have an idea of what your MVP should look like and a strong value proposition, you will still want to do a landscape review to make sure that the environment will support your proposition.

As with the value-proposition canvas, you may want to use the Mission Model Canvas to identify the key components of a successful effort. Early on, you may not have all of the pieces you need, but you should be thinking about which partners, stakeholders, beneficiaries, and resources you will need to be effective.

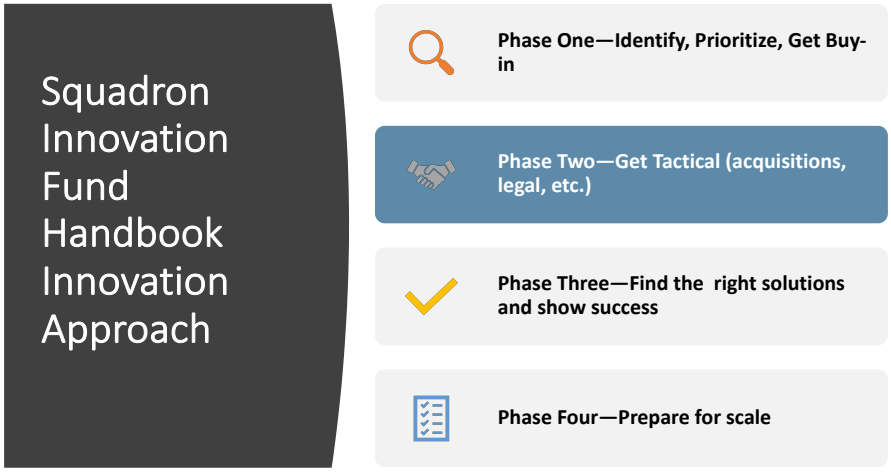


Source: AFWERX

PHASE TWO—GET TACTICAL (ACQUISITIONS, LEGAL, ETC.)

OVERVIEW

Execution of innovative and improvement ideas is a team sport. Although your solution likely go through multiple revisions over time, the absolutely best way to test your ideas is to put them into action and measuring how it goes. You will need to assemble a core team to support the proper execution. Additionally, you will need to work to gain leadership buy-in for your ideas. This could be as simple as regular briefings to leadership or inviting them to your innovation meetings.



MAPPING YOUR STAKEHOLDERS

To successfully navigate the various stakeholders in government procurement, it is vital to spend time understanding how they do their work and why they do it the way that they do. One way to help organize your own approach is to create a composite description (an "archetype"), for each relevant stakeholder.

The sooner you can start to fill in the blanks on the archetype, the better, because you will want to start working with them early on. Although involving too many stakeholders can be complex, if you can work with them early on, it will help build support for your work, identify potential opportunities or roadblocks specific to their roles, and reduce the need to make larger changes later by making smaller pivots earlier.

INFORMATION FOR STAKEHOLDER ARCHETYPES

- *Who are they?*
- *What do they do?*
- *What are their driving philosophies?*
- *What are their behaviors?*
- *What are their motivations/needs/goals?*

HOW TO DEVELOP AN INNOVATIVE ACQUISITION STRATEGY

In government, getting things done typically (though not always) requires procurement so understanding how to work with the various offices involved is important for the project's success.

INVOLVE YOUR PURCHASING OFFICIAL

Under law, only government purchase card holders or contracting officers may purchase things on behalf of the government. So, you will need to work with a purchasing official if you want to buy something.

As you are considering your approach, plan to start working with the appropriate contracting officer as soon as practicable. Obviously, there will be things you will need to do before you are ready to buy (including market research, securing the funding, etc.), but eventually you are going to need to make sure that your contracting officer has a clear understanding of the problem you are trying to solve, the types of providers for the solution (i.e., market research), and a reasonable timeframe in which to procure the solution. Plan to start working with your purchasing official early on to avoid frustration when you are ready to buy.

PROCUREMENT

When working with your contracting officer, think on at least two timescales: the near term and long term. Although you should not let

the long-term view prevent you from getting started, you should keep in mind the effects of scale.

As procurements grow in size and cost, they become progressively harder to get done quickly. Accordingly, you will need to build time into your schedule for procurement. You may want to consider how you can make procurement less burdensome for the contracting officer and industry. In other words, you want to keep the challenges of scale in procurement in mind as you move forward.

It is best to start working with the procurement office as soon as possible to ensure that the government is able to take advantage of the proper procurement method at the right time:

- **Micro-purchasing**. For small procurements (typically under $10,000), a government purchase-card ("GPC") holder can buy *directly* from a supplier without competition or extensive documentation. The purchasing official will need to ensure that the prices are appropriate and that certain paperwork is properly handled. In general, though, a micro-purchase is a fast, and extremely streamlined, way to buy.

- **Simplified Acquisition (FAR Part 13)**. For procurement under $250,000, contracting officers can use "simplified acquisition" procedures to acquire supplies and services, including construction, research and development, and commercial items.

- **Challenges**. Under the America COMPETES Act, an agency has the authority to establish ambitious prize competitions (up to a $50 million prize without Congressional approval) that will

"stimulate innovation that has the potential to advance the mission of the respective agency."

- **SBIR dual-use program.** The Small Business Innovation Research (SBIR) program encourages domestic small businesses to complete federal research/research and development (R/R&D) with the goal of creating potentially saleable products and services. Through a competitive, awards-based program, SBIR helps small businesses explore their technological potential and provides the incentive to profit from commercialization. By including qualified small businesses in the nation's R&D arena, SBIR stimulates high-tech innovation and fosters a spirit of entrepreneurialism.

- **Other transaction authorities (OTA)**. OTA allows the government, in certain circumstances, to enter into flexible business arrangements to acquire research and development activities to advance new technologies, and prototypes or models to evaluate technical or manufacturing feasibility or military utility of new or existing technology.

- **Broad Agency Announcements (BAA)**. BAAs are typically used to invite proposals for basic and applied research and development to advance or evaluate cutting-edge technologies in a specific problem area. Proposals submitted in response to BAAs may or may not lead to contracts.

- **Commercial Solutions Offering (CSO)**. A CSO is similar to a BAA, but a CSO can be used to acquire innovative commercial items, technologies, or services that directly meet program

requirements, whereas BAAs are restricted to basic and applied research. The CSO program may also be used to acquire R&D solutions from component development through operational systems development.

There are numerous organizations that are available to provide expertise on best practices associated with procurement of innovative solutions. For more information and other innovative acquisition methods, check out the Contracting Cone resource published by Defense Acquisition University.

INVOLVING FINANCE

One of the important ground rules of the SIF program is that all purchases made with Squadron Innovation Funds must meet Operations and Maintenance (O&M) funding rules at a minimum. Additionally, SIF funds should not be used to fill unmet needs that should be funded with other funding sources.

O&M funds are appropriated to cover expenses such as civilian salaries, travel, minor construction projects, operating military forces, training and education, depot maintenance, stock funds, and base operations support. They are available for just one year and are funded annually. O&M funds are what are used to support the SIF program.

Another funding source, Research, Development, Test and Evaluation (“RDT&E”) funds are appropriated to cover efforts performed by contractors and government activities required for the Research and Development (R&D) of equipment, material, computer application

software, and its Test and Evaluation (T&E) to include Initial Operational Test and Evaluation (IOT&E) and Live-Fire Test and Evaluation (LFT&E). RDT&E funds are available for a two-year period and are funded incrementally.

As you are considering future phases of scaling your idea, you will need to work closely with your comptroller and FM team to ensure that you can have the right funding source applied to your project.

INVOLVING TECHNOLOGY

When it comes to new technology or non-governmental computers the best avenue is to test your idea off the NIPR Network. Your ability to work with your comm flight will be crucial in getting approval for exceptions for commercial internet and non-standard computing equipment.

As a basic Rule of Thumb for software or computer hardware that was not purchased through AFWAY or approved by your comm flight: use it to test your ideas, run your 3D printer or write code, but **do not attempt to connect it to the AF network**! Use a commercial internet connection (approved by comm) or ask them to get you a cellular WiFi hotspot.

If you need to connect to the network or need to access data that is sensitive, plan to work with you comm flight and CISO and CIO representatives to get proper approvals and ensure security controls are applied.

INVOLVING LEGAL

Although it is unlikely that there will be many legal issues presented during the early phases of solution development, check in early with the Office of General Counsel ("OGC") to ensure compliance with applicable law, regulations, and policies. As you continue to develop and test your solution, you will want to regularly engage OGC.

INVOLVING USERS

Finally, although it may seem obvious, make sure to involve your users. Steve Blank, one of the leading voices on entrepreneurship, has said that the key to startup success is to "Get Out of the Building." By that, he means, that successful startups focus on engaging end users and customers early and often. But, don't always try and *pitch* your solution; instead, focus on *listening* to the users and understanding their needs.

A key part of improving processes involves getting out and walking and observing the process in action. It's important to go see, ask questions and to show respect to those performing the work when observing the process. The goal of this walk is to understand the behavior of the process and of the process performers.

On your end-to-end walk of the process you are really seeking to understand two key things:

1. What does our customer want? (Voice of our customer or VoC)
2. What does our process deliver? (Voice of our process or VoP)

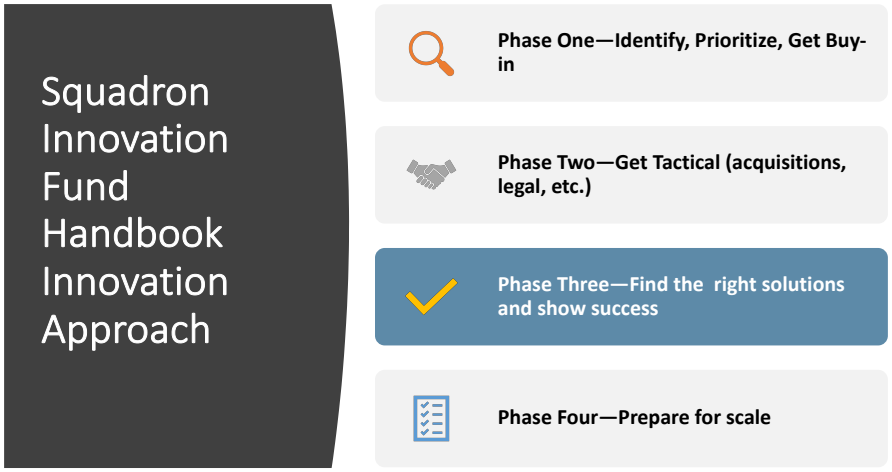
Once we understand VoC and VoP we can understand the delta between the two and begin using our eight-step approach for improving processes.

PHASE THREE—FIND THE RIGHT SOLUTIONS AND SHOW SUCCESS

OVERVIEW

After you have identified the proposed solution and engaged your core team, it is time to find the right industry partners to help you deliver it. Successful delivery requires market research and a solid roll-out strategy. It also requires that you track and measure your progress. In this chapter, we cover the steps you will need to take to bring your idea to end users, as well as the methods to begin to share and scale your solution.

Early on, you will need to establish metrics and goals early on so that you can determine whether your solution is working for your users. Make sure that your metrics are reality-based. Your goal should not be to prove how great your idea is, rather to validate that you have found an effective solution to a common problem.



CONDUCTING EFFECTIVE MARKET RESEARCH AS PART OF AN INNOVATIVE ACQUISITION

IMPORTANCE OF EFFECTIVE MARKET RESEARCH

Market research is the continuous process of collecting and analyzing data on products, services, business practices, and vendor capabilities to satisfy agency needs. Simply put, it is learning about your environment to make informed decisions about the acquisition of goods and services.

Although market research is treated like a “chore” in many government procurements, it should be the foundation for building an effective solicitation and a successful contract, and it is critical to the success of technological innovation.

In addition to the legal requirements for conducting market research as part of an acquisition, it will:

1. **Illustrate the art of the possible**. Without proper market research, you might not know what is technologically possible. Teams may think “X” is a great solution without realizing that “Y” — an even better solution — exists. As a result, you may improperly draft requirements, or risk using outdated technology before you even start your project.

2. **Let the perfect collaborator know you exist**. Most innovative technology vendors are not looking on sites like FedBizOpps.gov

(FBO.gov) and responding to traditional market research tools, like Requests for Information (RFIs). Therefore, they might not even know that you have requirements they could help solve.

When doing your market research you may find a company or brand that seems to solve your problem pretty well, however there is rarely only one company or brand of equipment will work. Competition is good for innovation: you do not know what is out there until you go through the process to get bids. Also, do not assume you need to hire a contractor to deliver a complete solution. If you can purchase the parts/hardware or “things” you need (through the appropriate means) there is a good chance a team of smart Airmen can figure out how to make it all work together.

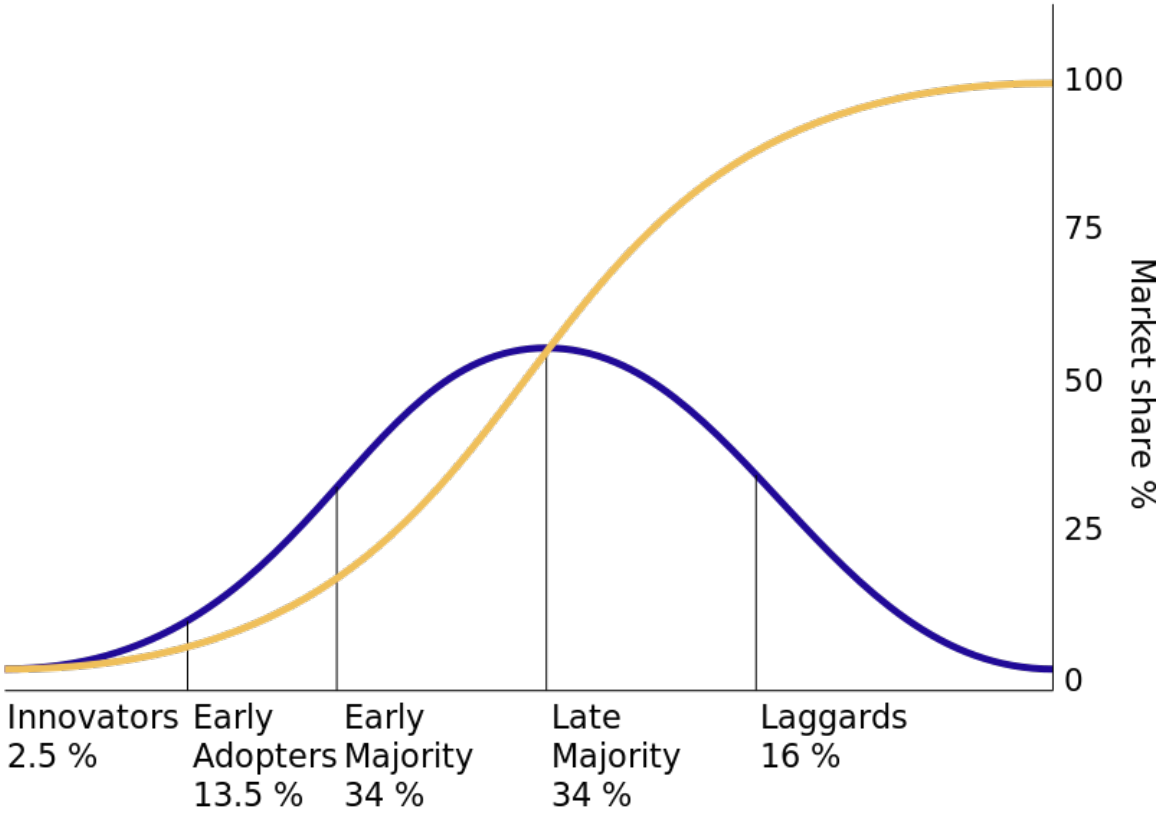
TECHNIQUES FOR INNOVATIVE MARKET RESEARCH

There are numerous techniques to conduct market research. Traditional methods include sending out as Sources Sought notices and Requests for Information. There are also myriad “innovative” techniques to conducting market research that can help make your acquisition more effective.

Traditional methods	Innovative methods
Investigation and discovery. Looking at other procurements, search engines, industry compilations (e.g., Gartner "Magic Quadrant")	**Accelerators and Venture Capital (VC) firms**. Communicating with accelerators and VCs can help predict where new capabilities may exist.
Sources Sought / Requests for Information. Written requests to industry seeking feedback on draft requirements or acquisition strategy.	**Publishing in trade-specific publications**. Most industries have trade-specific publications (e.g., Techcrunch or Wired for the technology sector) that may be a good source of communicating directly with potential industry partners.
In-person meetings or trade shows. By attending conferences, trade shows, or scheduling one-on-one meetings, you can gain deeper insights into particular companies' capabilities.	**Tech tourism**. Travel to tech hubs and, in each city, visit a handful of emerging technology companies at their offices to see how they operate.
Industry Days. By hosting public events inviting industry to learn more about government's requirements.	**Reverse industry days**. Flipping the script, reverse industry days invite industry to identify and track opportunities, pricing, preparing proposals, and various contract performance considerations to help the government shape its acquisition strategy.

HAVE A SOLID "ROLL-OUT" STRATEGY

Successful innovations do not happen overnight. They require adoption over time and, to achieve adoption over time, you need to have a strategy. Nearly all changes follow an "innovation diffusion" curve, as seen in the figure below:



Source: Everett M. Rogers, Diffusion of innovations

By recognizing that adoption over time relies on early adopters, part of your strategy needs to include efforts to gain feedback, information, and support from those individuals. During the early-adoption phase, you can adjust your innovative product or service to improve your solution.

Your strategy needs to acknowledge that rolling out to a broader group of users requires different approaches to increase awareness; overcome inertia, doubt, and uncertainty; and promote adoption. Universal adoption of your idea is achievable by thinking and mapping a plan to make the idea stick and then spread.

DELIVER, TRACK PROGRESS, AND SHOW SUCCESS!

This is the *fun* part of innovation and improvement: actually seeing whether your proposed solution can solve the needs.

Effective delivery requires measurement to ensure that you are on the right track. You need both quantitative and qualitative metrics to guide your work. Although there is no single set of metrics that will be appropriate for all solutions, the metrics should tie back to both value to the user and impact on mission. You can't improve that in which you cannot measure. Steps three and seven of our eight-step approach for improving processes involve meaningful VoC and or VoP measurements.

Quantitative metrics such as customer adoption, satisfaction, burden reduction, improved speed to mission, or cost reductions are all important, but qualitative metrics are also important for defining impact. For example, even if adoption is limited in the early stages, if airmen have a particularly strong emotional reaction—whether positive or negative—to a proposed solution, that is a useful indicator of future impact.

Even more important than metrics, though, is the process of observing *users interacting with the proposed solution*. By observing carefully how the solution is working "in the real world," you can gain important insights into ways to improve the proposed solution or identify new pain points that can help lead to more valuable innovations.

Regardless of what you measure, or how, you should make sure to *make observations* and *document your findings*. Through this process, you will have the critical information you need to make the case for continued funding or investment and receive additional inputs for new innovations.

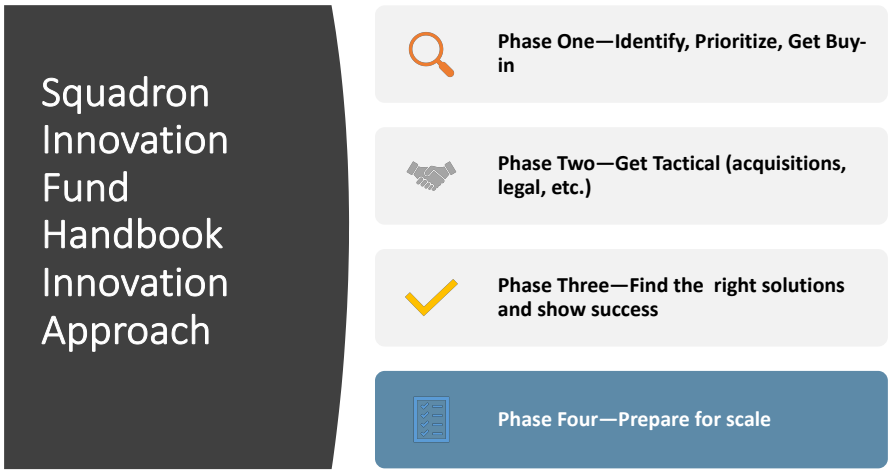
It is perhaps more important to record when a solution doesn't achieve the outcomes that you expected. Remember, as Thomas Edison observed "I have not failed 10,000 times—I've successfully found 10,000 ways that will not work." If you find a way that will not work, that is a useful insight to share throughout the organization.

The essential thing is to stay focused on your vision, track your progress, and report your results. Doing this repeatedly leads to success.

PHASE FOUR—PREPARE FOR SCALE

OVERVIEW

Congratulations! You've identified a problem worth solving, developed and tested a solution. Now comes arguably the most important—and hardest—part: scaling. With growth and scale come new opportunities and challenges.



SHARE/COMMUNICATE YOUR SUCCESS

Because you have submitted your project on Ideascale, there are specific questions to help you document what you have learned. The Outcomes stage is meant for you to share the failures and success of a project so the rest of the Air Force can learn and grow from this.

IMPORTANCE OF DOCUMENTATION

Because you have submitted your project on Ideascale, there are specific questions to help you document what you have learned. The Outcomes stage is meant for you to share the failures and success of a project so the rest of the Air Force can learn and grow from this.

Documenting how you got to where you are is an important part of shaping where you are going. Documentation helps prepare you for new opportunities that are aligned with your current success; it also helps remind you of your unique strengths. As Peter Drucker wrote: “it may be more important in innovation to build on one’s strengths because of the risks of innovation and the resulting premium on knowledge and performance capacity.”

Take the time to record what you have learned, how you have achieved it, where you have struggled, and where you think opportunities exist. It will make sure that you continue to grow effectively.

The eight-step approach for improving processes uses this technique of documenting clearly and cleanly in the following eight steps:

1. Clarify & Validate the Problem
2. Break down the Problem & Identify Performance Gaps
3. Set Improvement Target(s)
4. Conduct Cause Analysis
5. Develop Countermeasures & Implementation Plan

6. See Countermeasures Through

7. Confirm Results and Process Change

8. Standardize Successful Processes

The beauty of a well-produced eight-step problem solving model is that it serves as a one page storyboard of the whole approach. It provides a disciplined way of reporting on problems that encourages a disciplined way of solving problems. It eliminates the lengthy “death by PowerPoint” briefings in use today in that it forces the synthesis and distillation of the entire effort to be captured on a single side of a single piece of paper. This single piece of paper is approximately twice the size of your typical printer paper and is often called an “A3” due to the metric sized paper called A3. In fact, this eight-step problem solving model is often also just simply referred to as an A3.

Using our eight-step A3 provides clear context for issues and recommendations for leadership decision making and execution that improves our business process. When applied properly and consistently, CPI methodologies and tools help ensure problems that are solved, remain solved. The Air Force advocates using this standardized eight-step framework (A3) as the umbrella for Airmen to facilitate improvement efforts using a host of tools that help identify mitigate root causes so our processes remain improved.

ACKNOWLEDGING “LESSONS LEARNED”

When thinking about the next phase of your solution, if you only focus on the successes, you may miss important insights and opportunity

for improvement. Make the extra effort to acknowledge “lessons learned”:

- What did not work?
- What was unexpected?
- What things would you do differently if you could?
- What will you do differently next time?

By exploring these questions--and sharing the answers with others—you can develop better practices over time and identify new potential solutions to higher-value problems.

DEVELOPING A PRODUCT STRATEGY AND CUSTOMER ACQUISITION STRATEGY

VALUE OF PRODUCT STRATEGY

> *“Logistics Planning - The wisdom to realize when working on plan A, you'll run into conflicts in executing plan B and being properly prepared, and successfully executing plan E” ~Capt John P. Laverdure*

Earlier, we discussed the importance of developing a strong product vision, the “North Star” for your solution. As you move to scale your solution, it’s necessary to develop a product *strategy* for your solution.

There is no *single* explanation for what constitutes a good product strategy, but two leading voices help provide some guidance. Melissa Perri explains that a product strategy is "a system of achievable goals and visions that work together to align the team around desirable

outcomes for both the business and your customers." Marty Cagan describes a product strategy as a "sequence of products we plan to deliver on the path to realizing the vision."

The product strategy should be a description of *how* you will achieve your vision. Your strategy will likely change over time as you gain more insight and new capabilities, and it will be informed by both the unique challenges underlying the problem, the existing product and environment, and the unique capabilities of the product delivery team and organization.

Similar to logistics planning, developing and executing product strategy requires a willingness to adapt to new information and adjust, while still delivering on the vision

WHAT IS A PRODUCT ROADMAP?

The classic expression of product strategy is a roadmap, which details a sequence of measurable goals and expected outcomes. An agile roadmap will evolve throughout the life of any product you are working on, but should always represent the latest strategic thinking. Make it public and be clear about the bets you are making, who they are designed to help, and how you know you will win or lose. Your roadmap should be designed to meet the specific needs of your product's internal and external stakeholders and may look different from other product roadmaps in terms of structure and presentation.

Because we are agile in our approach, it's important for the everyone to understand that a roadmap is not a promise: it is a prediction, subject to change and typically created with the best available, yet imperfect, information. Take time with the team and stakeholders at regular intervals (every three months or so) to re-evaluate your strategy and make sure you all understand whether you are moving in the right direction. This ensures that everyone is already aligned if and when you have to pivot in a different direction.

Source: 18F Product Guide

CONSIDERING CUSTOMER ACQUISITION

Even though you have already identified early adopters for your solution, you will want to spend time thinking through ways of acquiring new end-users to try out your solution. Remember that after the early adopters, the remainder of the diffusion curve is actually the majority of the users. As you think about scale you will need to come up with different approaches to attract active and engaging new users to your solution.

CONCLUSION

Innovation and Improvement requires resources and discipline, but if you solve a deep and meaningful problem for your fellow Airmen, you will be joining the ranks of millions of innovators who have had a vision and saw it through to execution. Remember three things:

First, you can do it! Innovation and Improvement is not about advanced technologies or revolutionary new approaches. It is about applying technology, methods, or processes to solve problems facing airmen in the accomplishment of their mission. It is about finding ways to make a contribution and aiming high.

Second, do not do it alone! The AF has invested numerous resources with the goal of helping create an *ecosystem* for innovation. Reach out to fellow innovators, the SIF Connect line, your MAJCOM, Spark Cells, our Air Force CPI Office, and AFWERX. We can only succeed if we work together.

And, finally, continue to **THINK BIG, start small,** and ***Scale Fast!***